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## MINOR STUDIES FROM THE PSYCHOLOGICAL LABORATORY OF VASSAR COLLEGE

### XXXI. A STUDY OF FRESHMEN

By SOPHIE D. WHITE, SYBIL MAY, and M. F. WASHBURN

The class of 1918 at Vassar College was in its freshman year made the subject of certain psychological investigations. The data collected with regard to its members were derived from four sources: (1) the answers to a questionnaire, (2) the results of tests, (3) the marks given on the academic work of the freshman year, and (4) reports of certain students as especially 'promising,' made by members of the instructing staff to the president at his request. Each of these sources is subject to errors. The questionnaire answers are more or less trustworthy according to the interest of the student in answering the questions, and to her skill in introspection. The test results are affected by the interest of the student in the tests, her physiological condition at the time of testing, and an individual characteristic, distinct from the ability tested, which we may call 'ability to be tested,' the capacity to meet promptly a sudden demand for the exertion of one's powers. The marks are influenced by the preparation of the student for college, her physical condition, her interest in her work, and the personal equation of the instructor. The reports to the president were affected by the personal equation of the instructor and the interpretation put upon the rather vague term 'promise.'

The questionnaire was sent to all members of the class within the first two weeks of the college term. It was prefaced by the following statement: "The questions should be answered only in so far as it is possible to do so with a reasonable amount of thought: answers should not be invented for the sake of saying something. A blank may be left after any question which seems unanswerable in a given case. No marks or grades of any sort will be given to the answers, and no public use will ever be made of names."

The following questions bore on individual differences in imagery: "Can you readily remember what you hear, in a lecture for instance, or do you imperatively need to see a thing in print in order to remember it?" "Can you picture geometrical figures readily in your mind?" "Do you remember music well?" "Is the pronunciation of a foreign language especially hard for you to acquire?" "Do you have difficulty in scanning Latin and other verse?"

The following questions on 'interest' were asked: "What subjects of study do you find most interesting?" "What subjects of study do you find most uninteresting?" "Are you interested in working with your hands?" "Do you like laboratory work?" "Do you greatly enjoy poetry?"

The following questions related to endowment in language facility: "Do you remember the words of a passage readily, or the thought only?" "Do words come to you readily or with especial difficulty in an oral recitation?" "Do you like to write?"

The following questions referred to differences in the readiness with which attention is adapted to a given task, and the strength of 'de-

termining tendencies': "When out walking alone, is your attention usually more occupied with your surroundings or with your thoughts?" "Is it easy for you to turn from one task to another, or do you become so absorbed in one task that you cannot readily drop it?" "Do you work best in the morning or in the evening?" "Must you be absolutely alone in order to work effectively?" "Do you habitually plan the work of a day beforehand?" "Do you habitually carry out your plans, or do you often fail to finish your work when not compelled to do so?"

These topics were chosen because they represent individual differences readily accessible to untrained introspection, and not likely to be taken as a joke by the irreverent undergraduate, as subjects bearing directly on social and affective characteristics might have been. The endeavor was also made to frame the questions so that they could really be answered.

Two hundred and eighty-six replies to the questionnaire were received. With regard to the interests of the students in the subjects studied before entrance to college, the following facts appeared from these replies. (1) The ratio of the number of students who mentioned a certain subject as especially interesting, to the number who mentioned the same subject as especially uninteresting was, for history, 6.6; for English, 3.5; for modern languages, 2.9; for science, 2.6; for Latin, .76; for mathematics, .65. The interests of these incoming freshman girls thus appear to be least marked for Latin and mathematics, most marked for history and English. (2) When the number who thought a given subject especially interesting is added to the number who thought it especially uninteresting, we get a measure of the strength of the affective reaction to that subject: if the number is small, the students tend to regard the subject with indifference, being neither greatly interested nor greatly bored by it. Science has to be left out of this calculation, as not all the students offered it for entrance. Latin is regarded with the greatest indifference, the total number of extreme reactions to it being only 150; history comes next, with 161, modern language next, with 172; English next, with 196, and mathematics stands at the top, with 218; a high number which as the figures under (1) show is due to the number of persons who strongly dislike it.

Correlations by the presence and absence method were calculated for the answers to a number of the other questions.

(1) A slight negative correlation ( $-.21$ ) appeared between interest in mathematics and fondness for writing. The results showed that the chances are nearly even (46%) that a student in this group who dislikes to write will like mathematics; while they are only 1-3 (34%) that a student who likes to write will like mathematics. A moderate incompatibility between mathematical and literary expression is thus indicated.

(2) A slight negative correlation, obtained also between enjoyment of poetry and fondness for manual work ( $-.18$ ). Of those who enjoy poetry, only 24% like manual work; of those who dislike poetry, 81% like manual work.

(3) A still smaller negative correlation ( $-.16$ ) is shown between interest in science and attention to one's own thoughts rather than to the surroundings: thus of those who are not in the habit of observing their surroundings, 24% are specially interested in science, while of those who are habitually interested in their surroundings 31% are interested in science. These percentages are affected by

the fact that not all the students had had an opportunity of studying science.

(4) The highest positive correlation, one really significant, obtained between the claim to accurate verbal memory and the possession of oral fluency in recitation. It was .41. Of the students who say they readily remember the exact words of a passage, 71% say that words come readily to them in recitation: of the students who say they cannot remember the exact words of a passage, only 42% state that words come readily to them in recitation. Of the students who say words come readily, 37% claim accurate verbal memory; of those who say words come with difficulty, only 20% claim accurate verbal memory. This is a fact that points towards the existence of specialized verbal ability.

(5) A small positive correlation, .20, is shown between ability to shift attention readily and preference for the morning as a period of work. The majority of the observers said they could readily shift attention, and that they were morning workers. Of those who shift attention readily, 75% are morning workers; of those who do not, 66% are morning workers; of the morning workers, 79% have readily shifted attention; of the evening workers, 72% have readily shifted attention. These figures lend a little support to the idea that an evening worker is a person who takes a long time to adapt himself to work. It should be borne in mind that the experiments of Gates<sup>1</sup> indicate that the difference between morning and evening workers is one merely of habit.

The tests were the following: a test of verbal memory and memory for ideas by the use of the "Cicero" passage (Whipple's Manual of Physical and Mental Tests, volume II, page 209), read aloud to the observer; the Reading Backwards Test, with the passage about the Indians (Whipple, I, page 334), the Hard Directions Test (Woodworth and Wells); the Analogies Test (Woodworth and Wells); the Sentence Building Test, with the words "cup, fraction, money" (Whipple, II, page 261), and the reasoning test, about the man swimming in the river, used by Mrs. Woolley in her "Mental Traits of Sex." The results of this last test had to be discarded because we failed to get enough light on the method by which the various individuals solved the problem: it is easy to guess the correct answer. A source of error was involved in the testing, in that there were about thirty different testers, all advanced students of psychology. To reduce as far as possible the variations due to the individuality of the tester, all the testing was done in the laboratory, and the only instructions given to the freshmen were read to them from statements previously distated and made absolutely uniform.

(1) The numerical results of the tests were as follows:

(a) Verbal memory, average number of words, 34.1. Highest score, 81; lowest, 6.

(b) Memory for ideas, average number of ideas, 23. Highest score, 51; lowest, 6.

(c) Reading Backwards Test, average time, 410.6 seconds. Highest score, 126 seconds; lowest, 890 seconds.

(d) Analogies Test: average time for first list, 89.5 seconds; shortest time, 27 seconds; longest time, 285 seconds; average time for second list, 80 seconds; shortest time, 22 seconds, longest, 180 seconds.

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<sup>1</sup> Gates, A. I.: Variations in Efficiency During the Day. Univ. of Cal. Publications in Psychology, Vol. 2, No. 1, 1916.

(e) Hard Directions Test: average time, 153 seconds; shortest time, 38 seconds; longest time, 550 seconds.

(f) Sentence Building Test: average number of sentences, 5.5; average number of words per sentence, 15.6.

We undertook to correlate the test results with the class records of the students, by the following method. The system of marking at Vassar recognizes three grades only above passing; A, excellent; B, good; C, passing. The number of credit hours required for the successful completion of the freshman year is 30. In our calculation, each A on a student's record in the office was counted as 3; that is, if she received A in a three-hour course we counted 9 digits to her credit. Each B was reckoned as 2, and each C as 1; D's, or failures, were counted as minus 1's. By adding these numerical credits we obtained for each student a number representing her class-room work according to the instructors' judgments: these numbers ranged from 90, for a student who obtained a grade of A in all her 30 hours, to 30, or below in the case of students who failed in certain subjects. The distribution of the values thus obtained, however, was not such that indexes of correlation between them and the test performances could be found, for as a rule there were a number of students whose class performances were represented by the same number. We therefore selected, in the case of each test, the names of the students who stood in the first quarter and the last quarter when the results for that test were arranged in order, and calculated the average class standing of these two groups. If there was a marked difference between the average class standing of the first 25% of observers in a certain test and that of the last 25% of observers, we might conclude that positive correlation existed between excellence of class-room work and the ability tested. The average class-room standing of the entire class was 51.1.

For verbal memory, the average standing of the first 25% was 63.

For verbal memory, the average standing of the last 25% was 39.

The difference was 24.

For memory for ideas, the average standing of the first 25% was 62.

For memory for ideas, the average standing of the last 25% was 44.

The difference was 18.

For the Reading Backwards Test (speed of verbal perception), the average class standing of the first 25% was 63.

The average class standing of the last 25% was 44.

The difference was 19.

These three tests furnished the highest degree of correlation with the class-room performance of the observers. For sentence building (here the observers were ranked by the product of the number of sentences written and the number of words per sentence), the average class standing of the first 25% was 53.8. The average class standing of the last 25% was 41.8. The difference was 12. For the analogies test (average of both series), the average standing of the first 25% was 56.5; that of the last 25% 45.9; the difference was 10.6.

The Hard Directions Test correlated most poorly with class standing. For the first 25%, the average standing was 56.3; for the last 25% the average standing is 49. It appears that being slow at the Hard Directions Test does not imply academic performance noticeably below the average. It will be recalled that Meumann<sup>2</sup> distinguishes between an executive and a scholarly type of mind, according as one is able quickly to shift one's *Aufgabe* or is held by a persistent

<sup>2</sup> Intelligenz und Wille, S. 21.

*Aufgabe*: the scholarly type of mind might be expected to be slow in the Hard Directions Test, which demands rapid shift of attention and problem.

As an index of the presence of the kind of mental ability likely to produce high marks, the results of several tests taken together are most significant. There were eleven students who fell in the last quarter in three or more tests. Of these none quite reached average class standing (51.1): the rankings were 50, 50, 43, 45, 36, 33, 27, 24, 24, 21, 18. Of seven students who were in the last quarter in two tests, none reached average class standing.

There were seven students who were in the first quarter in four tests. One of these, whom we will call T., had only an average class standing: the standings of the others were 63, 66, 75, 87, 90, 90.

There were eight students who were in the first quarter in three tests. One of these (M.), had a class standing slightly below the average, namely, 48; one (W.) was just average; the standings of the others were 60, 75, 75, 78, 81, 84.

Thus it appears that excellent performance in several tests usually goes with excellent performance throughout the work of the freshman year; while very poor performance in several tests is correlated with a performance below the average in the work of the freshman year.

We obtained, finally, some interesting data connecting the test results with the commendation of certain students as especially 'promising' by their instructors. There were 88 students thus commended. Of these not one was found in the lowest quarter of excellence in more than one test. On the other hand, of the seven students who stood in the first quarter in four tests, every one was commended for promise, including the one (T.) whose class standing was only average. Of the eight students who were in the first quarter in three tests, six were commended for promise, including one (W.) whose class standing was only average.

#### XXXII. DIRECTED RECALL OF PLEASANT AND UNPLEASANT EXPERIENCES

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By MILDRED F. BAXTER, KOTO YAMADA, and M. F. WASHBURN

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The motive which led the senior author of this study to devise its method was the desire to explore possibilities of testing the temperamental characteristics of individuals. As might be expected from the great difficulty attending such investigations, the most definite results of the study relate not to individual psychology but to general psychology. However, we do not feel wholly discouraged with the results from the point of view of individual psychology.

Briefly, we wanted to see whether we could get anything like a test of the 'optimistic' or 'pessimistic' tendencies of individuals from the readiness with which, under definite instructions to do so, they recall pleasant and unpleasant personal experiences. The method was as follows.

The observer was first put through a practice series in ordinary free associations, the first thirty words of the Kent-Rosanoff series being used as stimulus words. The association times were taken with a stop-watch. Then the following instructions were given: "I shall now give you two other series of stimulus words. To the first